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EXAMINER	
MUI, CHRISTINE T	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/761,924	KEMPE, EBERHARD	
	Examiner	Art Unit	
	Christine T. Mui	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see remarks, filed 15 October 2007, with respect to the rejection(s) of claim(s) 1-18 under 35 USC 102 and 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of USP 4,821,585 to Kempe; USP 5,979,219 to Sellmer-Wilsberg; USP 5,331,845 to Bals; USP 4,869,873 to Klein et al.

2. Applicant's arguments, see remarks, filed 15 October 2007, with respect to claim 7 has been fully considered and are persuasive. The rejection under 35 USC 112 of claim 7 has been withdrawn.

Specification

3. The disclosure is objected to because of the following informalities:

4. On page 4, in the first paragraph, the instance where it reads "0,5" should be changed to "0.5".

5. On page 4, in the second paragraph, the instance where it reads "0,2 to 3,0 mm" and "0,01 to 2,0 mm" should be changed to "0.2 to 3.0" mm and "0.01 to 2.0 mm".

6. On page 4, in the third paragraph, the instance where it reads "0,2 to 10 mm" should be changed to "0.2 to 10 mm".

7. On page 4, in the second paragraph, the use of the trademark Teflon has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

8. On page 4, in the second paragraph, the full meaning for the abbreviation "PTFE" should be recited as polytetrafluoroethylene.

9. On page 64, in the first paragraph, the full meaning for the abbreviation "PTFE" should be recited as polytetrafluoroethylene.

10. On page 8, in the first paragraph, the instance where it reads "0,0 to 0,4" should be changed to "0.0 to 0.4".

Appropriate correction is required.

Claim Objections

11. Claim 3 is objected to because of the following informalities:

12. In claim 3, the full meaning for the abbreviation "PTFE" should be recited as polytetrafluoroethylene. Appropriate correction is required.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1, 9, 12 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by USP 4,821,585 to Kempe.

15. Regarding claim 1, the reference Kempe discloses a probe for the determination of the concentration of volatile components in liquids or gases. The probe comprises of an essentially tubular body consisting of essentially tubular, coaxial parts that are disposed within one another. The manufacture of the probe means according to the invention is made especially to avoid difficult machining operations by turning, so it is advantageous if the front end of the external part of the body is closed off by a plug-like closing member. A tubular permeation membrane, formed, preferably of silicone tubing is pulled over the front zone of the external part of the tubing and the closing member, which is interpreted to form a tight seal against the plug-like member to tightly cover the opening of the probe body. Within the inner member of the probe body there is located a semiconductor-type gas sensor that is disposed in the space between the back of the closing member and the front end of the internal tubular part. The membrane covers a helically extending permeation passage means, preferably a canal that joins a pararaxial carrier medium guide canal formed by a flute or a groove which is covered by the permeation membrane. The volatile component to be measured in the liquid or gas is threaded, forming the permeation canal and is cut into the external surface of the front zone of the external tubular part over a greater or smaller length to adjust the size of the exchange surface, and the guide canal is made accordingly shorter or longer. At the rear end of the carrier medium guide canal, it is connected to the ring-shaped carrier medium feed canal via a rear cross hole. The permeation canal is connected via a front cross bore in the external tubular part to a cross hole aligned with it in the closing member. The membrane is surrounded by a protective sleeve which is radially spaced

from the membrane and the rear of the sleeve has an internal screw thread that is screwed onto a screw threaded section in the mounting zone of the external tubular part. The protective sleeve may have multiple holes or perforations indicated to facilitate the flow past the permeation membrane. The probe also comprises of a radial connection piece provided in the rear zone of the probe body that is used to feed the carrier gas through the probe device through the cross bore, to the sensor and eventually through a guide canal where the gas exhaust on the other side of the probe device (see abstract, column 4, line 64-column 7, line 10). It is interpreted by the examiner that the semiconductor-type gas sensor is a sensor with a sensitive surface in the first measuring space that is consider being the space behind the closing member of the front end of the internal tubular part. The second measuring space is considered to be the permeation canal disposed adjacent to the tubular permeation membrane and the cross bore area that opens to a blind hold formed between the guide canal and the space with the semiconductor-type gas sensor is the measuring aperture.

16. Regarding claim 9, the reference Kempe discloses a probe for the determination of the concentrations of volatile components in liquids or gases comprising of a probe body consisting of two essentially tubular coaxial parts that are disposed one within the other. A tubular permeation member is pulled over the front zone of the external tubular part and around the front zone of the external tubular part where the membrane where it is surrounded by a protective sleeve that is radially spaced from the membrane (see abstract, column 5, lines43-45, column 6, lines 35-38). It is interpreted by the examiner

that the two tubular coaxial parts and the radially spaced protective sleeve are the first, second and third element arranged coaxially around each other.

17. Regarding claims 12 and 15, the reference Kempe discloses an O-ring seal that is provided between the two tubular parts, internal and external tubular parts at the front end of the probe body that is submersed in the container containing the volatile components (see column 5, lines 14-20). It is interpreted by the examiner that where the O-ring is provided between the two parts at an axial spaced location between the inner and external tubular member is considered to be mounted to the second element where it is to provide a seal in a groove of the internal tubular part.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kempe as applied to claim 1 above, and further in view of USP 5,979,219 to Sellmer-Wilsberg (herein referred "Sellmer").

21. Regarding claims 2-4, the reference Kempe discloses the claimed invention except for disclosing the permeable membrane consist of at least two layers. Kempe discloses the tubular permeation membrane is preferably of silicone tubing (see column 5, lines 43-44). Sellmer discloses a probe for measuring volatile components in an aqueous solution with a probe body with a continuous lumen, which isolates the lumen from the outside with a semiconductor gas sensor disposed in the housing inside the lumen at a distance from the membrane forming a measuring chamber filled with air. The sensor responds to gases permeating the membrane by changing the electrical resistance of the sensor. The membrane is suitable for prevaporation to measure the alcohol concentration in aqueous solutions where the permeable membrane has one side that is made of a pore-free polymer that is in contact with the liquid mixture with various components having a selective layer based on polysiloxanes such as polydimethylsiloxane or polyoctamethylcyclotetrasiloxane with a thickness of 10-20 μm. The membrane is based on silicone and/or polytetrafluorethylene to have a higher separation efficiency (see abstract, column 2,lines 41-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a multilayered membrane to improve the separation of components where the first layer of the membrane be made of a porous material such as PTFE that is the inner side of the membrane with a thickness in the range of 0.2 to 3.0 mm and a silicone polymer such

as polydimethylsiloxane that is the selective permeable layer of the membrane exposed to the aqueous solution of the thickness of 0.01 to 2.0 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller* 105, USPQ 233. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a multilayered membrane so that once the solution is in contact with the selective layer it can be efficiently transferred to the sensor without having to worry about impurities or other components reaching the sensor that are not components of interest.

22. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kempe as applied to claim 1 above, and further in view of USP 5,331,845 to Bals (herein referred "Bals").

23. Regarding claim 5, the reference Kempe discloses the claimed invention except for the volume of the measuring spaces. Bals discloses a free volume; the volume portion of the chamber accessible to alcohol vapor is to not exceed about 1000 μm and suggests a free volume range to be 50-500 μm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct probe with a volume space to allow the flow of the volatile component in the first and second measuring spaces within ranges dependent on the size of the probe, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

24. Claims 6-8, 10-11, 13-14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kempe.

25. Regarding claim 6, the reference Kempe discloses the claimed invention except for specifically disclosing the measuring aperture size, but it would have been obvious to one having ordinary kill in the art at the time the invention was made to construct the measuring aperture or the central bore area in Kempe within reasonable workable ranges dependent on the size of the probe, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

26. Regarding claims 7 and 19, the reference Kempe discloses a tubular permeable membrane, formed, preferably of silicone tubing with a diameter that is smaller than the external diameter of the front zone of the probe body that is pulled over the front zone of the external tubular part and the closing member, closing the opening of the probe body selectively allowing particular components of a volatile solution to permeate through the membrane to the device. The membrane covers a canal, which is considered to be the second measuring space, which is a permeation passage means (see column 5, lines 37-50). It is known in the art that silicone tubing is a porous material. It is interpreted by the examiner that the silicone tubing membrane that covers the permeation canal on the inside portion of the membrane is part of the second measuring space comprising of the porous silicone tubing.

27. Regarding claim 8, the reference Kempe discloses a probe for the determination of the concentration of volatile components in liquids or gases. The probe comprises of

an essentially tubular body consisting of essentially tubular, coaxial parts that are disposed within one another. The manufacture of the probe means according to the invention is made especially to avoid difficult machining operations by turning, so it is advantageous if the front end of the external part of the body is closed off by a plug-like closing member. A tubular permeation membrane, formed, preferably of silicone tubing is pulled over the front zone of the external part of the tubing and the closing member, which is interpreted to form a tight seal against the plug-like member to tightly cover the opening of the probe body. Within the inner member of the probe body there is located a semiconductor-type gas sensor that is disposed in the space between the back of the closing member and the front end of the internal tubular part. The membrane covers a helically extending permeation passage means, preferably a canal that joins a pararaxial carrier medium guide canal formed by a flute or a groove which is covered by the permeation membrane. The volatile component to be measured is liquid or gas is threaded to form the permeation canal where it is cut into the external surface of the front zone of the external tubular part over a greater or smaller length by adjusting the size of the exchange surface, and the guide canal is made accordingly shorter or longer. At the rear end of the carrier medium guide canal, it is connected to the ring-shaped carrier medium feed canal via a rear cross hole. The permeation canal is connected via a front cross bore in the external tubular part to a cross hole aligned with it in the closing member. The membrane is surrounded by a protective sleeve which is radially spaced from the membrane and the rear of the sleeve has an internal screw thread that is screwed onto a screw threaded section in the mounting zone of the

external tubular part. The protective sleeve may have multiple holes or perforations indicated to facilitate the flow past the permeation membrane. The probe also comprises of a radial connection piece provided in the rear zone of the probe body that is used to feed the carrier gas through the probe device through the cross bore, to the sensor and eventually through a guide canal where the is gas exhaust on the other side of the probe device. When in operation, the probe is introduced into a liquid or gas space, and a carrier medium (e.g. air or an inert gas) flows through the canals at a defined rate where the volatile components in the liquid or in the gas phase pass through the permeation membrane at different rates that correspond to their concentration and they enter the carrier medium. The carrier medium is saturated with the volatile component then reaches the sensor where the electrical properties change as a function of the concentration of the components or compounds to be measured (see abstract, column 4, line 64-column 7, line 29). Kempe does not specifically disclose the gas flow rate, but where the gas flow through the carrier medium at a defined rate is interpreted to be at a rate that is within workable range, such as a flow rate from 5 to 100 ml/min, with the disclosed probe such that the indication of volatile components may be measured in an efficient manner, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller* 105, USPQ 233.

28. Regarding claims 10-11, the reference Kempe discloses a probe body consisting of essentially two tubular coaxial parts which are disposed one within the other that is covered by a tubular permeable membrane and a protective sleeve, which is radially

spaced from the membrane. It can be seen in Figure 1 that the internal diameter of the external tubular part is larger than the external diameter of the internal tubular part in the zone adjoining and forward of the thickened end. An O-ring is arranged in a circumferential groove in the mounting zone in the assembled state of the probe that serves as a seal against a standard connection piece (see abstract, column 5, lines 21-45, column 6, lines 35-38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a sealing member to hold all three pieces, the internal tubular part, external tubular part and the protective sleeve, such as an O-ring member as the one holding the internal and external tubular members together, to ensure a tight seal between the members so that erroneous solutions or gases do not flow throughout the probe unless it is through the permeable membrane. It is interpreted by the examiner that the internal and external coaxial tubular member and the protective sleeve are all of cylindrical shape since the tubular members are disposed within one another and the protective sleeve surrounds the external tubular member.

29. Regarding claim 13, the reference Kempe discloses the claimed invention except for where the inside of the ring element is a part of an inner wall of the second measuring space, but Kempe discloses an O-ring seal that is provided between the two tubular parts, internal and external tubular parts at the front end of the probe body that is submersed in the container containing the volatile components (see column 5, lines 14-20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to move the O-ring element so that is part of the inner wall of the

second measuring space so that a secured air tight seal is made between the members of the probe, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse, 86 USPQ 70.*

30. Regarding claim 14, the reference Kempe discloses the claimed invention except for where the ring element is an integral part of the second element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the sealing ring as being an integral part to the probe, since it has been held that forming in one piece an article which as formerly been formed in two pieces and put together involve only routine skill in the art. *Howard v. Detroit Stove Works,* 150 U.S. 164 (1993).

31. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kempe as applied to claim 12 above, and further in view of USP 4,869,873 to Klein et al (herein referred "Klein").

32. Regarding claims 16-18, the reference Kempe discloses the claimed invention except for the aspect of using radially oriented channels leading to a second measuring space. Klein discloses a plurality of diffusion channels or ducts that are arranged coaxially with and in the longitudinal direction of the entire tubular casing that opens into the measuring space that permit high throughput of gas, for example six channels or ducts as seen in Figure 2 (see column 5, lines 65-68, column 6, lines 19-25, column 7, lines 6-16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct a probe with radially oriented channel to allow a high throughput of gas with the coaxially oriented channel leading to a measuring space

and it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the probe with only four channels instead of six channel as a matter of design choice for the desired high throughput of gases in the probe. The applicant has not disclosed that four channels increase or decrease the supply and/or exhaust of the carrier gas over six channels solves any stated problem or is for any particular purpose and it appear the invention would perform equally efficiently with six channels for carrying the gas.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine T. Mui whose telephone number is (571) 270-3243. The examiner can normally be reached on Monday-Friday 8-5; Alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on (571) 272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CTM

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